

We Claim:

1. A protection relay for a power line system where current on a bus is provided to one or more power lines for receiving and generating power, and
5 where associated with each of said power lines is a current transformer for providing a line signal current representative of current flowing through a respective line, and wherein said protection relay is operative for generating a trip signal in response to a detected power signal line fault, the protection relay comprising:

10 signal processor responsive to signal line currents for generating a trip signal in response to a detected fault on any one of power lines;
means for summing said signal line current, separately for each power line phase, for all power lines coupled to said bus and producing,
a first signal indicative of the phasor sum of all signal line currents,
15 and
a second signal representative of the magnitude sum of all signal line currents;
means for deriving,
a first time derivative signal representative of the first derivative of
20 said first signal, and
a first time derivative signal representative of the first derivative of said second signal;
means for deriving,

a first harmonic signal representative of the a selected harmonic of
said first time derivative signal, and

a second harmonic signal representative of the a selected
harmonic of said second time derivative signal;

5 means for determining the harmonic phase difference between said first
and second harmonic signals;

phase comparator means responsive to said harmonic phase difference
for selectively generating, a blocking signal for blocking said trip
signal if said harmonic phase difference satisfies a first condition;

10 and

trip signal generator responsive to said first and second signals for
generating a fault trip signal upon said first and second signals
being beyond a defined bus differential characteristic conditioned
upon the status of said blocking signal.

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2. A protection relay for a power line system were current on a bus is
provided to one or more power lines for receiving and generating power, and
where associated with each of said power lines is a current transformer for
providing a line signal current representative of current flowing through a
20 respective line, and wherein said protection relay is operative for generating a
trip signal in response to a detected power signal line fault, the protection relay
comprising:

signal processor responsive to signal line currents for generating a trip
signal in response to a detected fault on any one of power lines;

means responsive to said signal line currents for detecting current
transformer saturation; and

means for selectively generating a blocking signal for blocking said trip
signal in response to detection of current saturation of said current
transformer.

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